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**Water Potential Practice Problems**

Ms. Ottolini, AP Biology

1. Determine the water potential of a cell if Ψp = 0.3 MPa and Ψs = -0.5 MPa. Show all work!

2. A plant cell with a solute potential of -0.65 MPa maintains a constant volume when bathed in a solution that has a solute potential of -0.30 MPa and is in an open container. What is the pressure potential of the cell? Show all work!

*Assumptions you can make:*

* *In an open container, the pressure potential of a solution is zero. Therefore, the water potential of the solution outside the cell is…*

*Ψs + Ψp = Ψ 🡪 (-0.30) + (0) = -0.30 MPa*

* *If the plant cell maintains a constant volume when placed in the outside solution, then it must be in equilibrium with the outside solution. In other words, they must have the same water potential so that water won’t have the tendency to move in or out of the plant cell.*

3. The value for Ψ in root tissue was found to be -3.3 bars. If you take the root tissue and place it in a 0.1 M solution of sucrose at 20°C in an open beaker, what is the Ψ of the solution, and in which direction would the net flow of water be?

4. NaCl dissociates into 2 particles in water: Na+ and Cl-. If the solution in question 4 contained 0.1M NaCl instead of 0.1M sucrose, what is the Ψ of the solution, and in which direction would the net flow of water be?